

# JOURNAL OF CELLULAR PHYSIOLOGY

ANGUS F. GRAHAM, *Managing Editor*  
The Wistar Institute

## EDITORS

V. DEFENDI  
The Wistar Institute

P. SIEKEVITZ  
The Rockefeller University

P. I. MARCUS  
University of Connecticut

E. A. McCULLOCH  
University of Toronto

## ASSOCIATE EDITORS

W. R. AMBERSON  
Marine Biological  
Laboratories

R. S. KROOTH  
The University of Michigan  
Medical School

R. P. PERRY  
Institute for Cancer  
Research

D. W. BRONK  
The Rockefeller University

I. LIEBERMAN  
University of Pittsburgh

D. M. PRESCOTT  
University of Colorado

S. S. COHEN  
University of Pennsylvania

T. MAKINODAN  
Oak Ridge National  
Laboratory

R. B. ROBERTS  
Carnegie Institution  
of Washington

J. S. COLTER  
University of Alberta

L. A. MANSON  
The Wistar Institute

A. B. STAVITSKY  
Western Reserve  
University

B. EPHRUSSI  
C.N.R.S. Gif-sur-Yvette,  
France

D. MARSLAND  
Marine Biological  
Laboratories

H. H. TEMIN  
University of Wisconsin

H. GREEN  
New York University

D. MAZIA  
University of California

L. WARREN  
University of Pennsylvania

J. D. JUDAH  
University College, London

M. L. MENDELSON  
Hospital of the University  
of Pennsylvania

L. WEISS  
Roswell Park Memorial  
Institute

P. M. KRAEMER  
University of California

VOLUME 75

FEBRUARY, APRIL, JUNE 1970

PUBLISHED BY

THE WISTAR INSTITUTE OF ANATOMY AND BIOLOGY  
PHILADELPHIA, PA.

COPYRIGHT © 1970 BY  
THE WISTAR INSTITUTE PRESS

# Contents

No. 1 FEBRUARY 1970

ALICK R. JONES, THEODORE L. JAHN AND JAMES R. FONSECA. Contraction of Protoplasm. III. Cinematographic Analysis of the Contraction of Some Heterotrichs .....	1
ALICK R. JONES, THEODORE L. JAHN AND JAMES R. FONSECA. Contraction of Protoplasm. IV. Cinematographic Analysis of the Contraction of Some Peritrichs .....	9
JOHN W. KAPPLER. The Kinetics of DNA Methylation in Cultures of a Mouse Adrenal Cell Line .....	21
BRIAN S. SPOONER. The Expression of Differentiation by Chick Embryo Thyroid in Cell Culture. I. Functional and Fine Structural Stability in Mass and Clonal Culture .....	33
HELENE Z. HILL AND THEODORE T. PUCK. Enzyme Kinetics in Mammalian Cells. II. Simultaneous Determination of Rate Constants for the First Three Steps of Galactose Metabolism in Red Cells .....	49
LAROY N. CASTOR. Flattening, Movement and Control of Division of Epithelial-like Cells .....	57
KIYOSHI HIGUCHI. An Improved Chemically Defined Culture Medium for Strain L Mouse Cells Based on Growth Responses to Graded Levels of Nutrients Including Iron and Zinc Ions .....	65
THEODORE A. HARE AND ROBERT R. SCHMIDT. Nitrogen Metabolism during Synchronous Growth of Chlorella. II. Free-, Peptide-, and Protein-Amino Acid Distribution .....	73
VICTOR W. F. BURNS. Tracer Kinetic Analysis of Incorporation of Glucose and Adenine by Yeast Cells .....	83
MICHAEL G. CHEN AND JOHN C. SCHOOLEY. Recovery of Proliferative Capacity of Agar Colony-forming Cells and Spleen Colony-forming Cells Following Ionizing Radiation or Vinblastine .....	89
RUTH W. SHEARER AND BRIAN J. MCCARTHY. Characterization of RNA Molecules Restricted to the Nucleus in Mouse L-cells .....	97
HOWARD M. TEMIN. Control of Multiplication of Uninfected Rat Cells and Rat Cells Converted by Murine Sarcoma Virus .....	107
DAVID CARPENTER AND RUFUS GUNN. The Dependence of Pacemaker Discharge of <i>Aplysia</i> Neurons Upon $\text{Na}^+$ and $\text{Ca}^{++}$ .....	121
<i>Comments and Communications</i>	
J. D. HARE. Nuclear Alterations in Mammalian Cells Induced by L-Canavanine .....	129
R. R. NOVALES AND R. FUJII. A Melanin-dispersing Effect of Cyclic Adenosine Monophosphate on <i>Fundulus</i> Melanophores .....	133



## No. 2 APRIL 1970

ROBERT A. ROOSA AND ELLEN BAILEY. DNA-mediated Transformation of Mammalian Cells in Culture. Increased Transforming Efficiency Following Sonication .....	137
PETER C. NOWELL, BRUCE E. HIRSCH, DIANNE H. FOX AND DARCY B. WILSON. Evidence for the Existence of Multipotential Lympho-hematopoietic Stem Cells in the Adult Rat .....	151
JOHN F. FOLEY AND BYRON TH. AFTONOMOS. The Use of Pronase in Tissue Culture: A Comparison with Trypsin .....	159
NATALY V. LATSIK, ELEN A. LURIA, ALEXANDER J. FRIEDENSTEIN, NINA L. SAMOYLINA AND IOSIPH L. CHERTKOV. Colony-forming Cells in Organ Cultures of Embryonal Liver .....	163
J. S. HASKILL, T. A. MCNEILL AND M. A. S. MOORE. Density Distribution Analysis of <i>In vivo</i> and <i>In vitro</i> Colony Forming Cells in Bone Marrow .....	167
M. A. S. MOORE, T. A. MCNEILL AND J. S. HASKILL. Density Distribution Analysis of <i>In vivo</i> and <i>In vitro</i> Colony Forming Cells in Developing Fetal Liver .....	181
K. W. JEON AND I. J. LORCH. Strain-specific Mitotic Inhibition in Large Mononucleate Amoebae .....	193
AUGUSTO BONDANI AND RALPH KARLER. Interaction of Calcium and Local Anesthetics with Skeletal Muscle Microsomes .....	199
J. F. WHITFIELD, J. P. MACMANUS AND R. H. RIXON. The Possible Mediation by Cyclic AMP of Parathyroid Hormone-induced Stimulation of Mitotic Activity and Deoxyribonucleic Acid Synthesis in Rat Thymic Lymphocytes .....	213
NORMAN S. WOLF AND JOHN J. TRENTIN. Differential Proliferation of Erythroid and Granuloid Spleen Colonies Following Sublethal Irradiation of the Bone Marrow Donor .....	225
CHARLES LEVINSON AND LESLIE E. BLUMENSON. Calcium Transport and Distribution in Ehrlich Mouse Ascites Tumor Cells .....	231
ROBERT M. ZUCKER. Fetal Erythroid Cell Development: Density Gradients and Size Distributions .....	241
DOROTHY R. TOVELL, ELIZABETH W. GARBUTT, LOUISE YAREMKO AND JOHN S. COLTER. The Interaction of Mengo Virus Ribonucleic Acid with L, HeLa and Human Diploid Cells: A Comparative Study .....	253
Errata .....	263

## No. 3 JUNE 1970

D. J. A. SUTHERLAND, J. E. TILL AND E. A. McCULLOCH. A Kinetic Study of the Genetic Control of Hemopoietic Progenitor Cells Assayed in Culture and <i>In vivo</i> .....	267
E. W. GERNER, M. C. GLICK AND L. WARREN. Membranes of Animal Cells. V. Biosynthesis of the Surface Membrane during the Cell Cycle ....	275
BERNARD SHAPIRO, GEORGE KOLLMANN AND DAVID MARTIN. The Diversity of Sulfhydryl Groups in the Human Erythrocyte Membrane .....	281
ANA M. VIGLIOCCO, ALCIDES F. REGA AND PATRICIO J. GARRAHAN. Membrane Phosphatase and Active Transport in Red Cells from Different Species .....	293
JUDY RAE CHURCHILL AND GEORGE P. STUDZINSKI. Thymidine as Synchronizing Agent. III. Persistence of Cell Cycle Patterns of Phosphatase Activities and Elevation of Nuclease Activity during Inhibition of DNA Synthesis .....	297
JU. M. VASILIEV, I. M. GELFAND, V. I. GUELSTEIN AND E. K. FETISOVA. Stimulation of DNA Synthesis in Cultures of Mouse Embryo Fibroblast-like Cells .....	305
PETER G. W. PLAGEMANN. Effects of Phenethyl Alcohol on Transport Reactions, Nucleotide Pools and Macromolecular Synthesis in Novikoff Rat Hepatoma Cells Growing in Suspension Culture .....	315
S. E. PFEIFFER, H. R. HERSCHMAN, J. LIGHTBODY AND G. SATO. Synthesis by a Clonal Line of Rat Glial Cells of a Protein Unique to the Nervous System .....	329
R. A. RAFF. Induction of Fatty Acid Synthesis in Cultured Mammalian Cells: Effects of Cycloheximide and X-rays .....	341
RICHARD G. HAM, LOUANN W. MURRAY AND GERALD L. SATTLER. Beneficial Effects of Embryo Extract on Cultured Rabbit Cartilage Cells ..	353
HISASHI SANUI. pH Dependence of the Effect of Adenosine Triphosphate and Ethylenediaminetetraacetate on Sodium and Magnesium Binding by Cellular Membrane Fragments .....	361
Index to Volume 75 .....	369

